



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,650	07/01/2003	Adnan H. Anbuky	9405-2	2087
20792	7590	05/04/2006	EXAMINER	
MYERS BIGEL SIBLEY & SAJOVEC			GRANT, ROBERT J	
PO BOX 37428			ART UNIT	
RALEIGH, NC 27627			2838	
			PAPER NUMBER	

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/611,650		ANBUKY ET AL.	
	Examiner		Art Unit	
	Robert Grant		2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 06 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-22, 37 and 38 is/are allowed.
- 6) ☒ Claim(s) 1-6, 12-27 and 30-35 is/are rejected.
- 7) ☒ Claim(s) 7, 8, 28, 29 and 36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3,5,6; 23-25, 27, 30-33, and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by Boost et al. (US 6,532,425).

As to Claim 1, Boost discloses a method of estimating reserve life for a battery, the method comprising: adaptively modifying a model of battery reserve life that is a function of a SOH indicator responsive to intermittent capacity tests of the battery (Column 7, lines 55-65 and Column 8, lines 11-15); monitoring the SOH indicator for the battery to generate SOH indicator values (Column 7, lines 66-67 and Column 8, lines 1-3); and generating estimates of reserve life from the generated SOH indicator values according to the adaptively modified model of battery reserve life (Column 12, lines 20-30).

Art Unit: 2838

As to Claim 2, Boost discloses a method according to claim 1, wherein adaptively modifying a model of battery reserve life comprises adaptively modifying the model of battery reserve life responsive to battery reserve life estimates that are based on the capacity tests (Column 7, lines 55-65 and Column 8, lines 11-15).

As to Claim 3, Boost discloses a method according to claim 1, wherein adaptively modifying comprises performing a capacity test responsive to detection of a change in reserve life as estimated by the model of battery reserve life, and modifying the model of battery reserve life responsive to the capacity test (Column 7, lines 55-65 and Column 8, lines 11-15).

As to Claim 5, Boost discloses a method according to claim 1, wherein the battery reserve life model expresses reserve life as a function of at least one of a float voltage, a float current, a temperature, a charge/discharge cycling, an impedance, a conductance, a resistance, and a coup de fouet parameter (Column 8, lines 32-37).

As to Claim 6, Boost discloses a method according to claim 1, comprising initializing the model of battery reserve life based on rated reserve life and/or a training test (Column 12, lines 31-33).

As to Claim 23, Boost discloses an apparatus for estimating battery reserve life, the apparatus comprising: means for adaptively modifying a model of battery reserve life

Art Unit: 2838

that a function of a SOH indicator responsive to intermittent capacity tests of the battery (Column 7, lines 55-65 and Column 8, lines 11-15); means for monitoring the SOH indicator for the battery to generate SOH indicator values (Column 7, lines 66-67 and Column 8, lines 1-3); and means for generating estimates of reserve life from the generated SOH indicator values according to the adaptively modified model of battery reserve life (Column 12, lines 20-30).

As to Claim 24, Boost discloses an apparatus according to claim 23, wherein the means for adaptively modifying comprises means for adaptively modifying the model of battery reserve life that a function of a SOH indicator responsive to reserve life estimates generated by the intermittent capacity tests (Column 7, lines 55-65 and Column 8, lines 11-15).

As to Claim 25, Boost discloses an apparatus according to claim 23, wherein the means for adaptively modifying comprises means for performing a capacity test responsive to detection of a change in reserve life as estimated by the model of battery reserve life and for modifying the model of battery reserve life responsive to the capacity test (Column 7, lines 55-65 and Column 8, lines 11-15).

As to Claim 27, Boost discloses an apparatus according to claim 23, wherein the battery reserve life model expresses reserve life as a function of at least one of a float

Art Unit: 2838

voltage, a float current, a temperature, a charge/discharge cycling, an impedance, a conductance, a resistance, and a coup de fouet parameter (Column 8, lines 32-37).

As to Claim 30, Boost discloses an apparatus, comprising: an adaptive battery reserve life estimator configured to adaptively modify a model of battery reserve life for a battery that is a function of a SOH indicator responsive to intermittent capacity tests of the battery (Column 7, lines 55-65 and Column 8, lines 11-15), to monitor the SOH indicator for the battery to generate SOH indicator values (Column 7, lines 66-67 and Column 8, lines 1-3), and to generate estimates of reserve life from the generated SOH indicator values according to the adaptively modified model of battery reserve life (Column 12, lines 20-30).

As to Claim 31, Boost discloses a computer program product for estimating reserve life of a battery, the computer program product comprising computer program code embodied in a computer readable medium (Figure 1, elements 111 and 112), the computer program code comprising: first program code configured to adaptively modify a model of battery reserve life that is a function of a SOH indicator responsive to intermittent capacity tests of the battery (Column 7, lines 55-65 and Column 8, lines 11-15); second program code configured to monitor the SOH indicator for the battery to generate SOH indicator values (Column 7, lines 66-67 and Column 8, lines 1-3); and third program code configured to generate estimates of reserve life from the generated

Art Unit: 2838

SOH indicator values according to the adaptively modified model of battery reserve life (Column 12, lines 20-30).

As to Claim 32, Boost discloses a computer program product according to claim 31, wherein the first program code is configured to adaptively modify the model of battery reserve life responsive to reserve life estimates generated by the intermittent capacity tests (Column 7, lines 55-65 and Column 8, lines 11-15).

As to Claim 33, Boost discloses a computer program product according to claim 31, wherein the first program code is configured to cause a capacity test responsive to detection of a change in reserve life as estimated by the model of battery reserve life and to modify the model of battery reserve life responsive to the capacity test (Column 7, lines 55-65 and Column 8, lines 11-15).

As to Claim 35, Boost discloses a computer program product according to claim 31, wherein the battery reserve life model expresses reserve life as a function of at least one of a float voltage, a float current, a temperature, a charge/discharge cycling, an impedance, a conductance, a resistance, and a coup de fouet parameter (Column 8, lines 32-37).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4, 26 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boost in view of Caravello et al. (US 5,705,929).

As to Claim 4, 26, and 34, Boost discloses a method according to claim 1, 23, and 31, wherein adaptively modifying comprises performing a capacity test, and modifying the reserve life model responsive to the capacity test (Column 8, lines 5-10). Boost does not expressly disclose the capacity test being responsive to detection of a lapse of predetermined time interval. Caravello teaches of performing a capacity test at predetermined time intervals (Column 14, lines 51-53). It would have been obvious to one having ordinary skill in the art at the time of this invention to use Caravello's teaching of performing a capacity test after a period of time has passed, with the system of Boost, in order to have an updated model without having to wait for the battery to discharge as required by Boost.

Response to Arguments

5. Applicant's arguments filed 2-6-06 have been fully considered but they are not persuasive. As to the arguments, with respect to claims 1, 23, 30, and 31, Boost does

in fact “adaptively modifying a model of battery reserve life ... responsive to intermittent capacity tests of the battery” as can be seen in the cited column 7, lines 55-58. The intermittent capacity tests occur in Boost every time there is a discharge, and then the true age of the battery is adjusted.

As for the argument concerning claims 1, 23, 30, and 31, which seem to focus on “Boost does not change the underlying model”. The Claim language simply states “modifying a model”, the examiner reads this as being any change made in any model (i.e. value, state, or projected performance). Therefore, the reserve life being adjusted after discharge, is a modification of a model.

As for the arguments around claims 3, 25, and 33, which is directed at the capacity test of Boost not being responsive to detection of a change in the reserve life, the examiner disagrees, because every time there is a discharge of the battery, the reserve life of the battery will change.

6. Applicant's arguments with respect to claim 4, 26, and 34 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

7. Claims 7-8, 28-29 and 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: Claims 7-8 and 28-29 recite, inter alia, monitoring a first state of health indicator during a first time interval to generate first state of health indicator values for the first time interval, and generate a reserve life estimates from the first state of health indicator values, then monitoring a second state of health indicator to generate second state of health indicator values for a second time interval; and generating estimates of reserve life from the generated second state of health indicator values according to a second model of battery reserve life. The art of record does not disclose, teach, or suggest the above limitations, nor would it have been obvious to one of ordinary skill in the art to modify the art of record to do so.

9. Claim 36 recites, inter alia, a method of modifying the thermal accumulation model of battery reserve life based on the estimate of battery reserve life generated from the capacity trend model of battery reserve life. The art of record does not disclose, teach, or suggest the above limitations, nor would it have been obvious to one of ordinary skill in the art to modify the art of record to do so.

10. Claims 9-22 and 37-38 are allowed.

11. The following is an examiner's statement of reasons for allowance: Claims 9-22 and 37-38 recite, inter alia, a method of estimating the reserve life of a battery by generating a first estimate of reserve life from a first stat of health estimate, generate a second reserve life estimate based on a capacity test of the battery, generate a second

state of health value and generate a third reserve life estimate based on the second state of health value. The art of record does not disclose, teach, or suggest the above limitations, nor would it have been obvious to one of ordinary skill in the art to modify the art of record to do so.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Grant whose telephone number is 571-272-2727. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on 571-272-2084. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RG


KARL EASTHOM
SUPERVISORY PATENT EXAMINER